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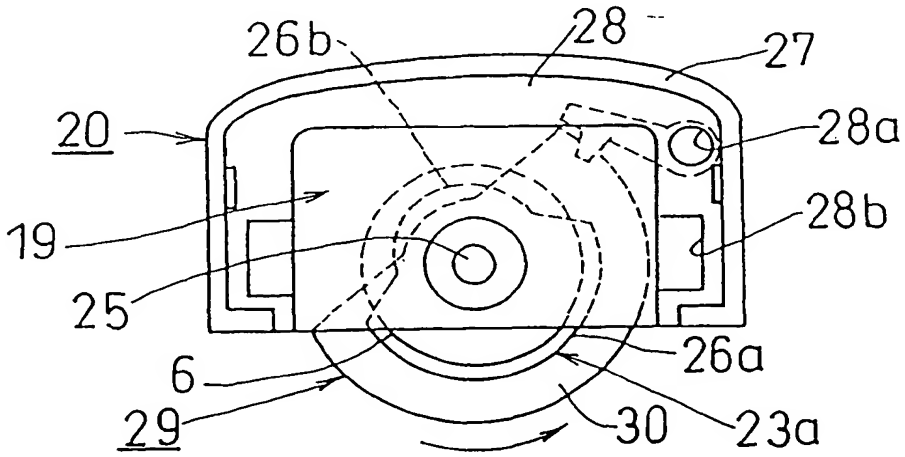
(54) Cutter blade cassette and attachment thereof

(57) There are provided a cutter blade cassette and an attachment thereof to easily handle a cutter blade in a paper cutting machine. A cassette attachment (20) is mounted to a slider in a paper cutting machine. A cutter blade cassette (19) is engaged with a recess portion formed in a separation wall (28) of the cassette attachment (20). A large diameter arc portion (26a) of a protective plate in the cutter blade cassette (19) is aligned with an arc plate (30) of a knob guide member (29). If the knob guide member (29) is rotated, the large diameter arc portion (26a) and a large diameter portion within the arc plate (30) can be retracted into the inside, and causing the cutter blade 6 to be exposed. Accordingly, the cutter blade 6 can be easily handled as the cutter blade cassette 19.

F I G.5



EP 0 976 511 A2

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a cutter blade cassette and an attachment thereof having no direct contact with a cutter blade even during an attaching operation.

2. Description of the Related Art

[0002] Many conventional paper cutting machines for cutting sheets of paper having large sizes such as "A3" and "B5" are operable by sliding cutter blades. Such cutter blades that are generally received and maintained within cases for the sake of handling are taken out from the cases for attachment.

[0003] One example of such conventional paper cutting machines is described with reference to Figs. 16 and 17. Referring first to Fig. 16, a paper cutting machine 1 for cutting a sheet of paper W (in Fig. 17) with a cutter blade 6 contained therein, in which a paper pressing plate 3 is placed on a paper placing base 2 in combination with a rail 4 provided with a slider 5, is operable by moving the slider 5.

[0004] As shown in Fig. 16 and 17, the slider 5 is moved while holding by the rail 4 through a sliding portion 7. A top cover 8 is retained at the top position relative to the sliding portion 7 due to biasing forces of springs 9 (see Fig. 17). For the cutting operation, a depression of the top cover 8 in the direction indicated by the arrow may cause a holder 10 and a cutter cover 11 connected to each other to move downward. As a result, the cutter blade 6 will reach the sheet of paper W.

[0005] As apparent from Fig. 16, the cutter cover 11 is formed with a knob 12 projected at the center, and holes (not shown) are formed therein at the left and right hands of the knob. Bolts 10a shown in Fig. 17 are coupled into these left and right-handed holes formed in the cutter cover 11, and knob nuts 12a in Fig. 16 are threaded thereon. A shaft 11b is mounted to the cutter cover 11 by a screw 11a, and the cutter blade 6 is then attached to the shaft 11b through a hexagon collar 11c.

[0006] The cutter blade 6 having a disc shape is used for the paper cutting machine 1, which is equipped with a case 13 for accommodating the single cutter blade 6, as shown in Fig. 18.

[0007] The case 13 is so arranged that two plates are engaged with each other in a freely openable/closable manner through a pair of pins 14, and has a holding portion 15 into which the cutter blade 6 is held, a round projection portion 16 to be fitted into a hexagon hole 6a formed in the cutter blade 6, and a U-shaped groove 17 formed considering operability.

[0008] Meanwhile, if faces of the case are slant upon opening the case 13 for an attachment of the cutter blade 6 to the paper cutting machine 1, the cutter blade 6 may be dropped to adhesively lie on a disposed surface or the like to the paper cutting machine 1. Consequently, it is troublesome to pick up the cutter blade 6. The cutter blade 6 having a blade at the edge will be hard to be operated, and an additional attention must be paid to its handling for the attachment.

[0009] For replacement, the cutter blade 6 detached from the paper cutting machine 1 should be accommodated in the case 13 for convenience's sake in handling, which will be also hard to be operated as in the attachment. Further, the case 13 that is empty must be prepared.

[0010] The present invention has been made in view of the foregoing description, and therefore an object of the present invention is to provide a cutter blade attachment capable of an easy attachment/replacement operation without any direct contact with a cutter blade.

SUMMARY OF THE INVENTION

[0011] In order to attain the foregoing object, according to a first aspect of the present invention, there is provided a cutter blade cassette characterized in that a cutter blade used in a paper cutting machine is accommodated in a housing with partially projecting therefrom, and a protective plate for covering the projecting portion of the cutter blade can be received in the housing.

[0012] According to a second aspect of the present invention, there is provided a cutter blade cassette including: a disc-shape cutter blade used in a paper cutting machine; and a protective plate having a larger diameter arc portion and a smaller diameter arc portion than the cutter blade, and is characterized in that the cutter blade and the protective plate are coaxially rotatable within a housing.

[0013] According to a third aspect of the present invention, there is provided a cassette attachment including a frame body having an engagement portion with a slider body, characterized in that the frame body is formed with a positioning recess portion for fixing a housing of a cutter blade cassette thereto, and the frame body is equipped with a knob guide member placed on the positioning recess portion having a large periphery so as to correspond to a protective plate of the cutter blade cassette, and that the knob guide member serves to cooperate with the protective plate.

[0014] According to a fourth aspect of the present invention, there is provided a cassette attachment including a frame body having an engagement portion with a slider body, characterized in that the frame body is formed with a positioning recess portion for fixing a housing of a cutter blade cassette thereto, and the frame body is equipped with a knob guide member placed on the positioning recess portion having a cut-away round corresponding to the cutter blade so as to be coaxially engaged with the cutter blade cassette, and that the knob guide member is formed with a retaining portion.

[0015] According to a fifth aspect of the present invention, the above-described cassette attachment is characterized in that the frame body to be attached to the slider body is equipped with a locking mechanism for the knob guide member, and the frame body is formed with a hole to which a bar is inserted for releasing the locking mechanism of the knob guide member provided at the slider body.

[0016] The cutter blade is received within the housing, one part of the peripheral surface of which projects from the housing but the projecting portion is covered with a separate member. The separate member can be moved only when the cutter blade is attached to a cassette attachment. When the knob guide member is turned, the part of the peripheral surface of the cutter blade is exposed. This allows the paper cutting machine to be ready for use. Further, since the housing can be separately handled, the cutter blade can be easily handled.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

For a better understanding of the present invention, reference is now made of the following description taken in conjunction with the accompanying drawings in which:

Figs. 1a and 1b are perspective views each showing a cutter blade cassette in accordance with an embodiment of the present invention;

Fig. 2 is a perspective view showing a cassette attachment in accordance with the embodiment of the present invention;

Fig. 3 is a perspective view showing the cassette attachment to which the cutter blade cassette has been attached in accordance with the embodiment of the present invention;

Fig. 4 is a side view showing the inside of the cassette attachment of Fig. 2;

Fig. 5 is a side view showing the cassette attachment of Fig. 3;

Figs. 6a and 6b are explanatory diagrams exemplifying a stopper shown in Fig. 4;

Fig. 7 is a sectional view showing a paper cutting machine in accordance with the embodiment of the present invention;

Fig. 8 is a side view showing a slider body shown in Fig. 7;

Fig. 9 is a side sectional view showing a cutter blade cassette and a cassette attachment of Fig. 7;

Fig. 10 is a side sectional view showing the cutter blade cassette and the cassette attachment of Fig. 7;

Fig. 11 is a side view showing a slider body in accordance with another embodiment of the present invention;

Fig. 12 is a sectional view showing the slider body of Fig. 11;

Fig. 13 is a side view showing a slider in accordance with still another embodiment of the present invention;

Fig. 14 is a sectional view showing the slider of Fig. 13;

Fig. 15 is a sectional plan view showing the slider of Fig. 13;

Fig. 16 is a side view of a conventional slider;

Fig. 17 is a sectional view showing the slider of Fig. 16 that is exploded in part; and

Fig. 18 is a perspective view showing a case for a conventional cutter blade.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] Preferred embodiments of the present invention will now be described with reference to the accompanying drawings.

[0019] A paper cutting machine is generally shown in Fig. 7, in which a slider body 18 is movably engaged with a rail 4 positioned on an upper surface of a paper placing base 2, and a top cover 8 is mounted at the top of the slider body 18 through springs 9. A cassette attachment 20 to which a cutter blade cassette 19 is attached is also adapted to be mounted to the slider body 18. The slider body 18 is held by a pair of arms 21 shown in Fig. 8 (one of these arms is shown).

[0020] Turning to Figs. 1a and 1b, a cutter blade cassette 19 includes a cutter blade 6 formed into a disc-shape, an edge of which is projected in part from a square housing 22 made of plastics. A cover (protective plate 23) covers the projecting part of the cutting blade 6. As shown in Fig. 1a, the housing 22 is made up of an accommodating portion 22a having openings at the top and one side, and a lid portion 22b covering the top. The accommodating portion 22a is formed with a bearing 24 shown in Fig. 1b, and a shaft 25 is inserted into a hexagon hole formed at the center in the cutter blade 6 and into a protective plate 23. The accommodating portion 22a and the lid portion 22b are engaged with each other and made in a fitting manner through an engaging groove 22c formed on a side surface.

[0021] The protective plate 23 for covering an projection portion of the cutter blade 6 appears disc-like having a double-round portion in which a larger round portion 23a abutting the cutter blade 6 lies on a smaller round portion 23c formed with a square recess portion 23b. The smaller round portion 23c is rotatably fitted into the lid portion 22b. In Fig. 5, the larger round portion 23a contains a large diameter arc portion 26a having a larger diameter and a small diameter arc portion 26b having a smaller diameter than the diameter of the cutter blade 6, respectively. Accordingly, as shown in Fig. 1b, while the large diameter arc portion 26a is exposed, the cutter blade 6 is covered (see Fig. 9). While the protective plate 23 is rotated to expose the small diameter arc portion 26b, the cutter blade 6 is ready for use (see Fig. 10).

[0022] The cassette attachment 20 shown in Fig. 2 is made up of a frame body 27 and a separation wall 28 which are integrally fitted into each other through an engagement groove 27a. A knob guide member 29 is rotatably disposed within the cassette attachment 20. The separation wall 28 is formed with a pin hole 28a and a pair of arm groove holes 28b, which are mounted to the slider body 18 in the paper cutting machine 1. The separation wall 28 is also formed with a recess portion 28c on which the cutter blade cassette 19 is to be mounted. A round hole 28d is also formed in the separation wall 28 for abutting with the cutter blade cassette 19. Further, as shown in Fig. 3, a round hole 27b having a partially cutaway portion is also formed in the frame body 27 so as to allow the knob guide member 29 to be freely rotated.

[0023] As shown in Figs. 3 and 9, the knob guide member 29 is so arranged that an arc plate 30 and a knob 31 are coupled with each other by a screw. A small diameter portion 32 formed within the knob 31 is brought into a slidable contact with the hole 27b formed on the frame body 27. The knob 31 engaging with the frame body 27 is secured to the arc plate 30, so that these are integrated. The arc plate 30 is formed with a round base 33 on the surface at the recess portion 28c side, and a square base 34 having a hole 30a at the center is formed on the round base 33. The round base 33 is slidably connected with a hole 28d formed in the separation wall 28, while the square base 34 is engaged with the square recess portion 23b in the cutter blade cassette 19. The shaft 25 is inserted into the hole 30a formed at the center in the square base 34.

[0024] As apparent from Figs. 2 to 4, the arc plate 30 and the knob 31 in the knob guide member 29 appear cut-away round in part, and those are adapted to be aligned in faces with each other when the cutter blade 6 is exposed. More specifically, the cutter blade cassette 19 as constructed in Fig. 1b is attached to the cassette attachment 20 as constructed in Fig. 2 (see Figs. 5 and 9). As the knob 31 is turned in the direction indicated by the arrow, the connection of the square base 34 and the square recess portion 23b may allow the protective plate 23 to be rotated. As a result, the cutter blade 6 is exposed (see Fig. 10). During this, a groove 30b and a step portion 30c which are formed in the arc plate 30 shown in Fig. 4 are retained by a stopper 35 at the respective opening/closing positions. This eliminates an excessively or insufficiently rotational operation. Reference numeral 36 denotes a leaf spring, and 37 denotes a rotary shaft.

[0025] A description will now be made of a structure in which the cutter blade 6 can be exposed upon an attachment to the slider 5 in the paper cutting machine 1.

[0026] As shown in Fig. 4, while the stopper 35 is engaged with the groove 30b in the arc plate 30, these may be disengaged from each other because these contact faces are slant. However, if a circumferentially exerted force is applied in a different direction from a direction in which the stopper 35 is disengaged, the arc plate 30 cannot be rotated, thereby preventing the cutter blade 6 from being exposed.

[0027] As shown in Fig. 6a, a taper face 38a oblique in the circumferential direction is formed on a shaft portion 38 of the stopper 35, and a pin 39 of the slider body 18 is pressed to contact with the taper face 38a when the cassette attachment 20 is attached to the slider body 18. Therefore, once the pin 39 is inserted, the stopper 35 will be rotated and separated from the groove 30b, to thereby rotate the knob guide member 29. As a result, the cutter blade 6 can be exposed. On the other hand, Fig. 6b illustrates a stopper 35 having a pair of taper faces 38a, corresponding to a shape of the pin 39 of the slider body 18.

[0028] With this arrangement, the cutter blade cassette 19 can be of course attached to the cassette attachment 20. In addition, the cutter blade cassette 19 can be attached to the slider body 18, and the cutter blade 6 can be exposed. Therefore, the cutter blade 6 is prevented from being held by hands during the attachment process, thereby providing a simple attachment/replacement operation.

[0029] Figs. 11 and 12 depict another type of the slider body 18 which is shaped into an arc at the top face. This slider body 18 is aligned in shapes at the top arcs with the cassette attachment 20 as shown in Fig. 2 when the cassette attachment 20 is attached to the slider body 18. This provides an improvement of look and feel upon the attachment.

[0030] Another preferred embodiment of the present invention will now be described with reference to Figs. 13 to 15. What is different in configuration from the previously described embodiments is that the top cover 8 is fixed to the slider body 18 by the screw 40. For this purpose, a locking plate 41 juxtaposed on the side surface of the slider body 18 is formed with a round hole 41a and a pair of arms 42. The bearing 24 of the cutter blade cassette 19 is inserted into the round hole 41a for support so that the cassette attachment 20 is held between the pair of arms 42. It will be noted that a stopper 43 within the frame body 27 shown in Fig. 15 is adapted to prevent the cassette attachment 20 from coming loose relative to the slider body 18.

[0031] While sheets of paper are cut, the tip of the cutter blade 6 is positioned beyond the paper pressing plate 3. If the cutter blade 6 is not used, the protective plate 23 extends so as to cover the cutter blade 6. For cutting sheets of paper, the slider 5 is once left at an end of the rail 4.

[0032] As described above, the present invention provides a cutter blade cassette and a cassette attachment. According to a first aspect of the present invention, a cutter blade received in a housing is covered with a protective plate capable of being received in the housing. Therefore, the cutter blade can be covered or exposed in accordance with necessity, providing an easy handling of the cutter blade.

[0033] According to a second aspect of the present invention, a disc-shaped cutter blade is employed. Therefore, the cutter blade can be covered or exposed by rotating a protective plate, providing a paper cutting machine with a simple structure in which the cutter blade and the protective plate may be coaxially connected to each other. This results in an easy handling of a cutter blade cassette.

[0034] According to a third aspect of the present invention, a cutter blade cassette is mounted to a recess portion in a frame body in a cassette attachment, a knob guide member is operated to retract a protective plate, and then, the cutting blade can be ready in an easy manner for cutting sheets of paper. Therefore, a cassette attachment can provide an easy handling of a cutter blade.

[0035] According to a fourth aspect of the present invention, a cutter blade cassette is mounted to a frame body, a knob guide member is turned, and therefore a protective plate of the cutter blade cassette and a large diameter portion of the knob guide member are retracted to expose a cutter blade. The cutter blade can be turned by a certain angle by a retaining portion. This can provide a constant exposure of the cutter blade, allowing the cutter blade to be ready in an easy manner for cutting sheets of paper. This results in a cassette attachment having a good operability.

[0036] According to a fifth aspect of the present invention, with the foregoing arrangement as described in conjunction with the third and fourth aspects, the frame body is attached to a slider body to thereby release a locking of the knob guide member. This can prevent the cutter blade from being exposed when the cutter blade cassette is attached to the cassette attachment. This also provides a simple handling of the cutter blade cassette and the cassette attachment.

Claims

1. A cutter blade cassette, wherein a cutter blade used in a paper cutting machine is accommodated in a housing with partially projecting therefrom, and a protective plate for covering the projection of said cutter blade can be received in the housing.

2. A cutter blade cassette including: a disc-shape cutter blade used in a paper cutting machine; and a protective plate having a larger diameter arc portion and a smaller diameter arc portion than the cutter blade, respectively, wherein said cutter blade and said protective plate are coaxially rotatable within a housing.

3. A cassette attachment including a frame body having an engagement portion with a slider body, wherein:

   said frame body is formed with a positioning recess portion for fixing a housing of a cutter blade cassette thereto, and said frame body is equipped with a knob guide member placed on said positioning recess portion having a large periphery so as to correspond to a protective plate of the cutter blade cassette; and
   said knob guide member serves to cooperate with the protective plate.

4. A cassette attachment including a frame body having an engagement portion with a slider body, wherein:

   said frame body is formed with a positioning recess portion for fixing a housing of a cutter blade cassette thereto, and said frame body is equipped with a knob guide member placed on said positioning recess portion having a cut-away round corresponding to the cutter blade so as to be coaxially engaged with the cutter blade cassette; and
   said knob guide member is formed with a retaining portion.

5. A cassette attachment as claimed in claim 3 or 4, wherein the frame body to be attached to the slider body is equipped with a locking mechanism for said knob guide member, and the frame body is formed with a hole into which a bar is inserted for releasing the locking mechanism of said knob guide member provided at the slider body.

FIG.1 (a)

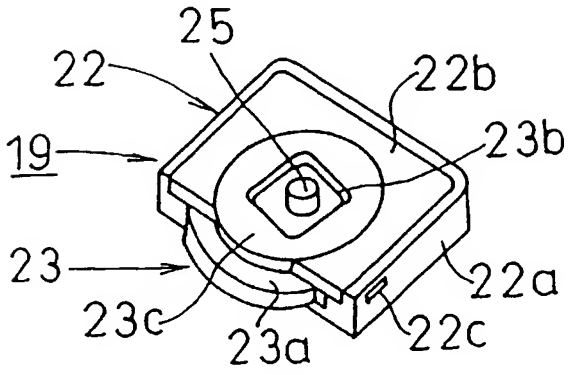


FIG.1 (b)

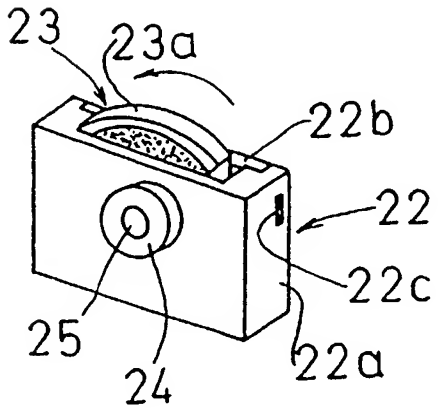


FIG. 2

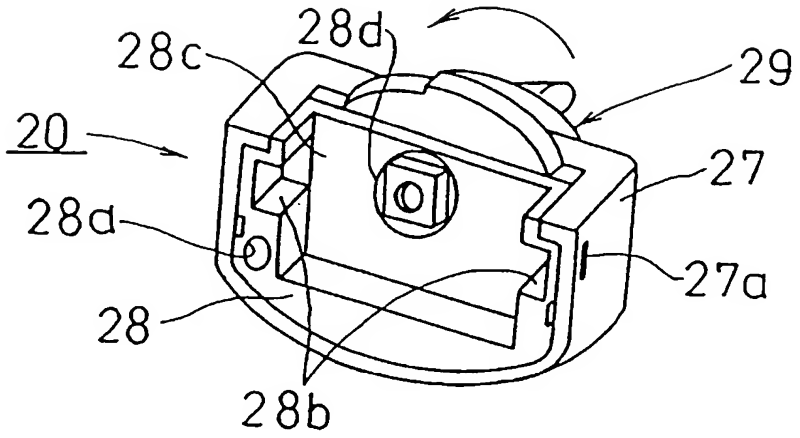

28d
28c
29
20
27
28a
27a
28
28b

FIG. 3

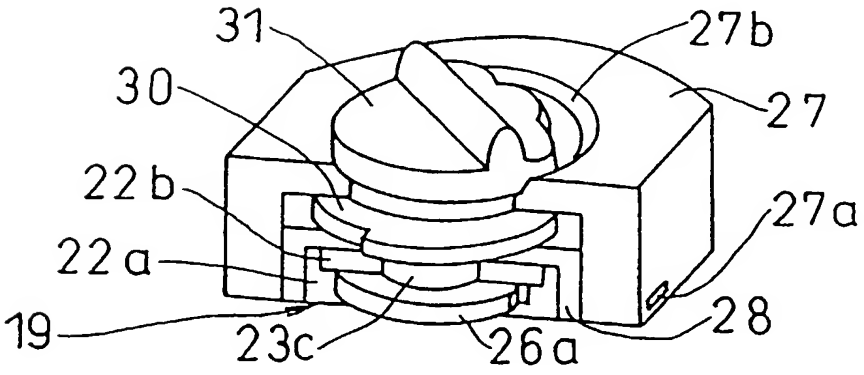

31
27b
30
27
22b
27a
22a
19
23c
26a
28

FIG. 4

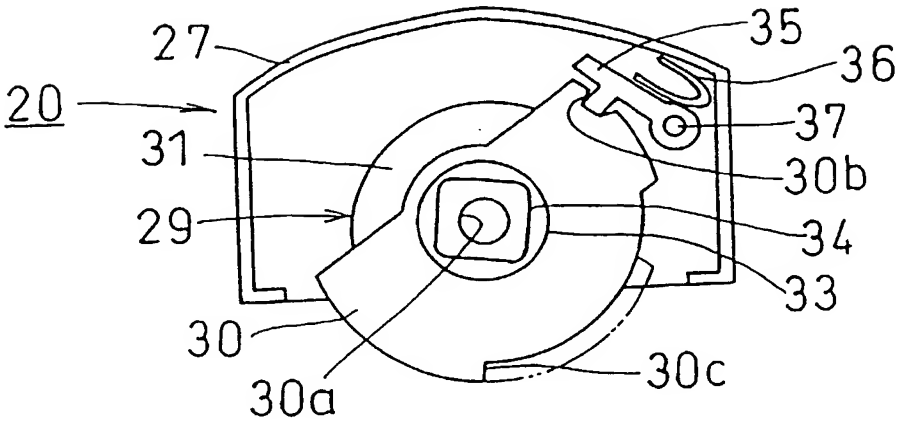

27
35
36
20
37
31
30b
29
34
33
30
30c
30a

FIG. 5

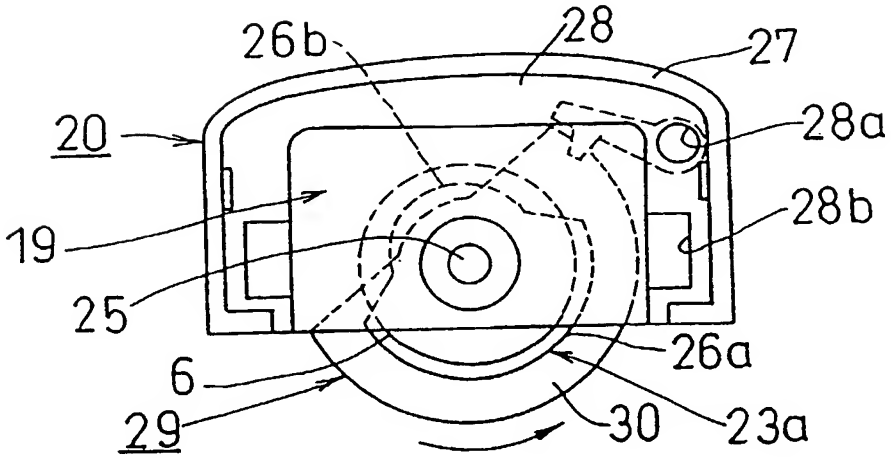

26b
28
27
20
28a
19
28b
25
26a
6
29
30
23a

FIG.6 (a)

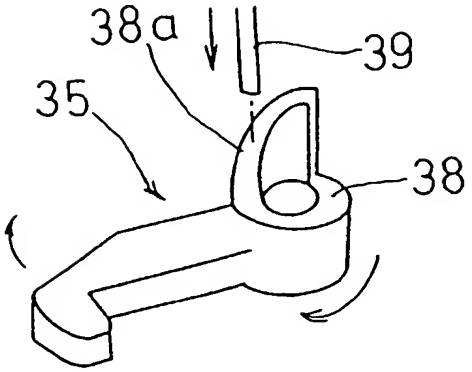


FIG.6 (b)

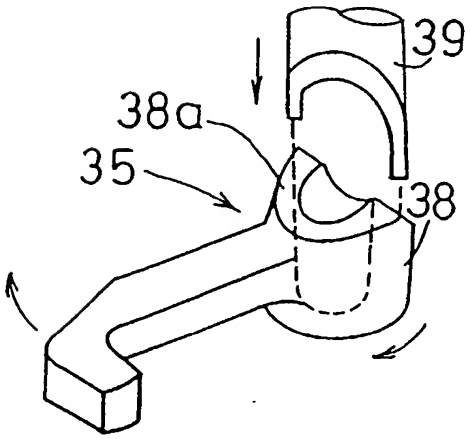


FIG.7

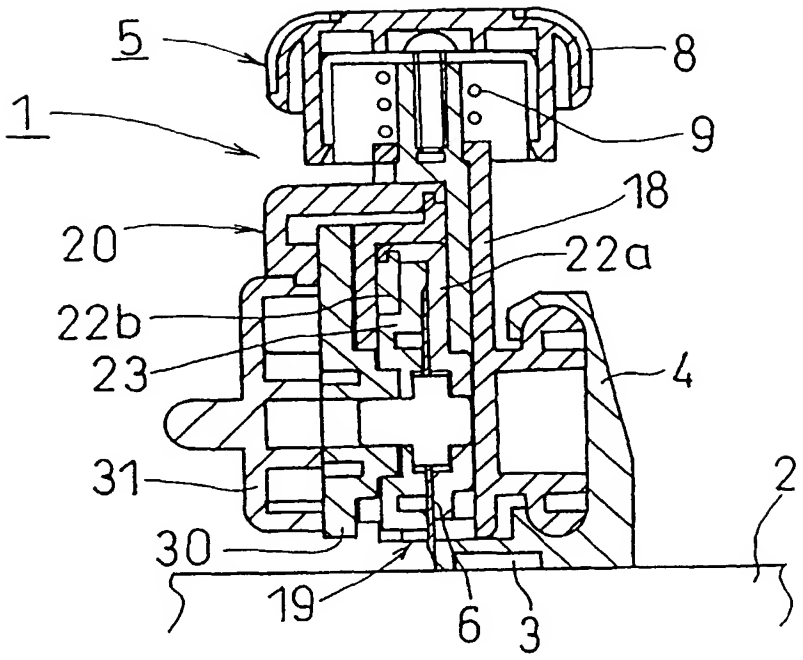


FIG.8

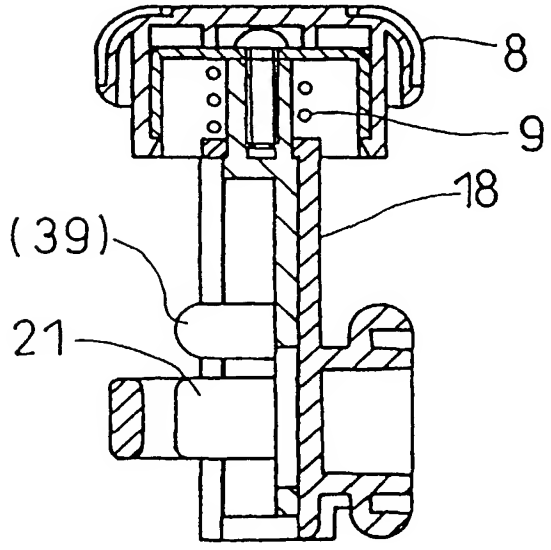


FIG. 9

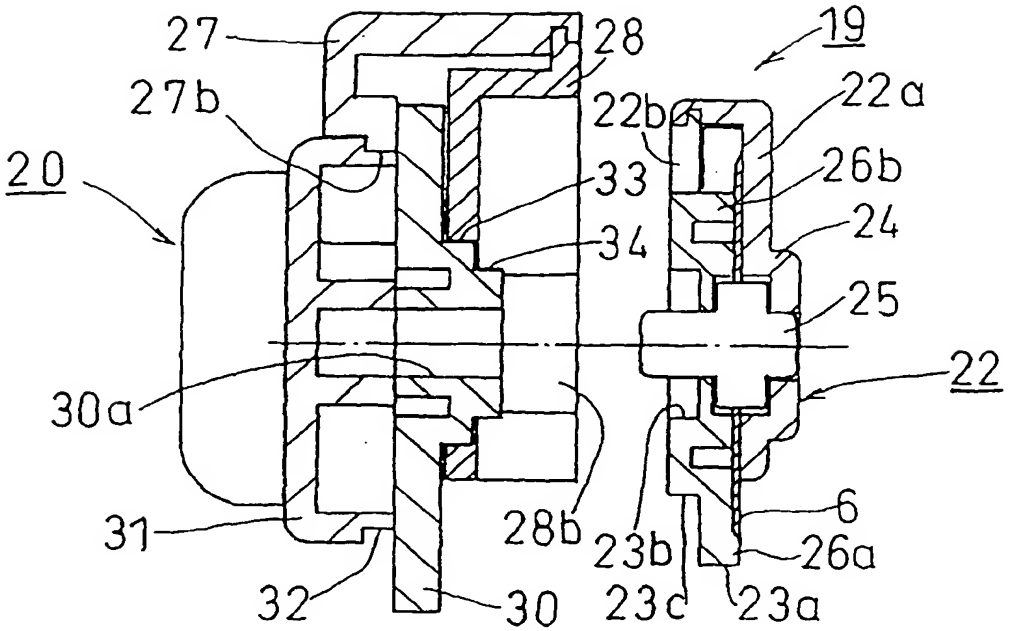

27
28
19
27b
22b
22a
20
33
26b
34
24
25
22
30a
31
28b
23b
6
26a
32
30
23c
23a

FIG. 10

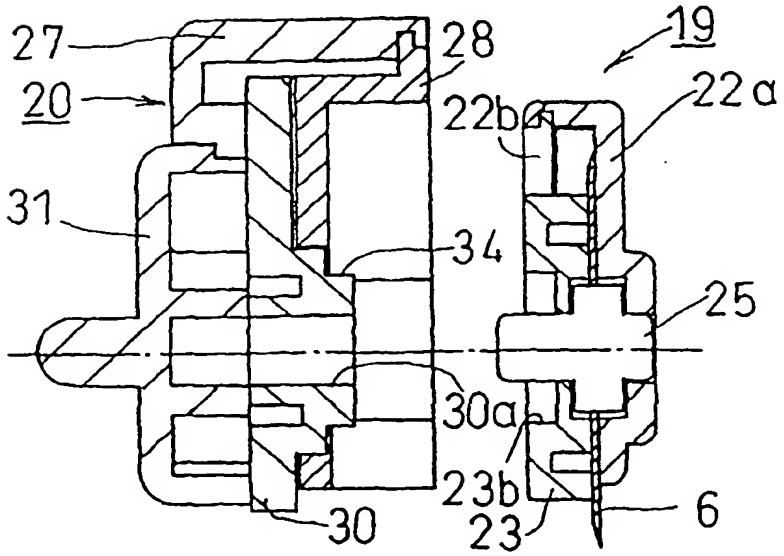

27
28
19
20
22b
22a
31
34
25
30a
23b
6
30
23

FIG.11

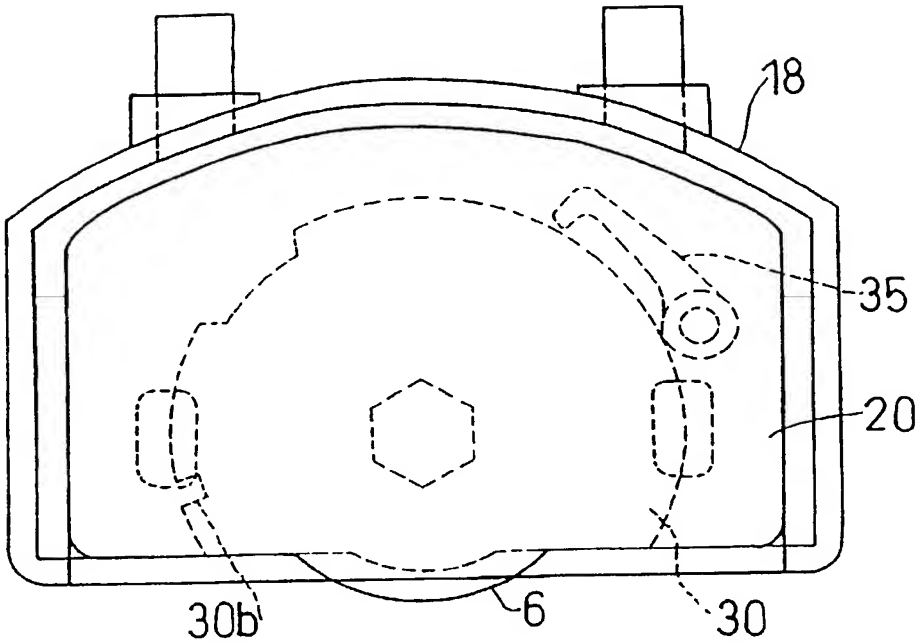


FIG.12

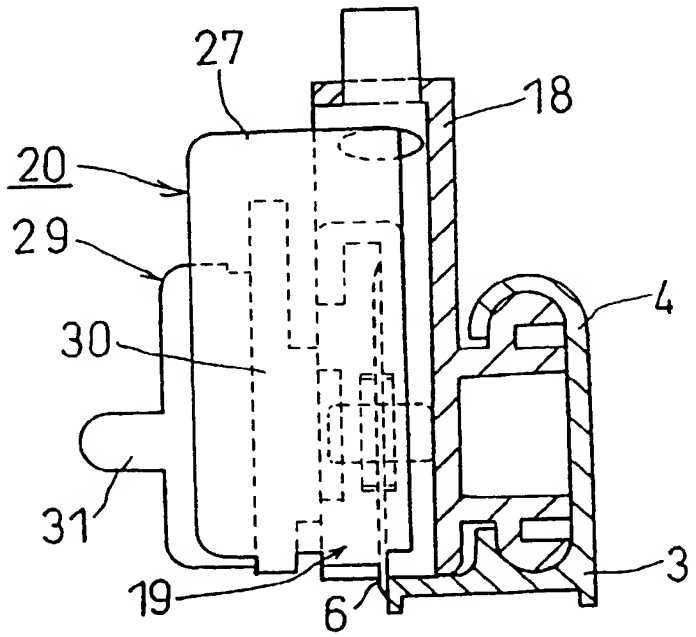


FIG.13

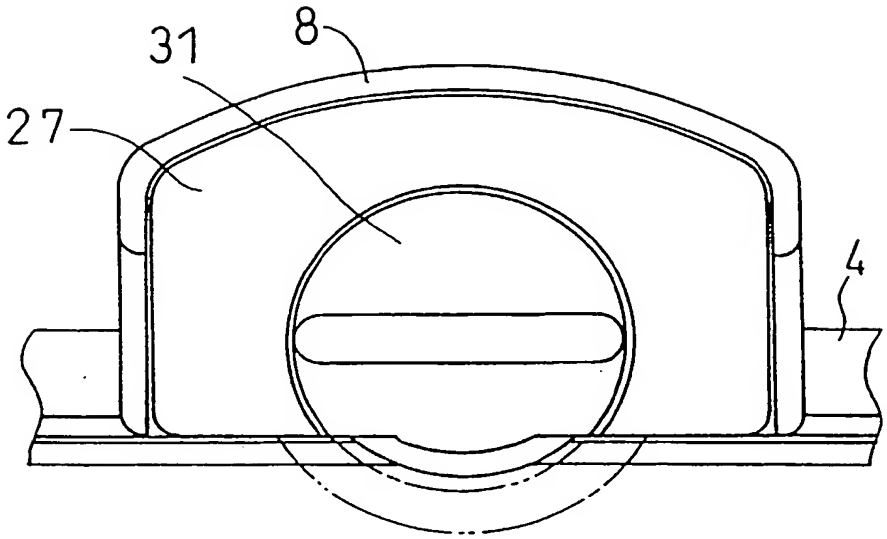


FIG.14

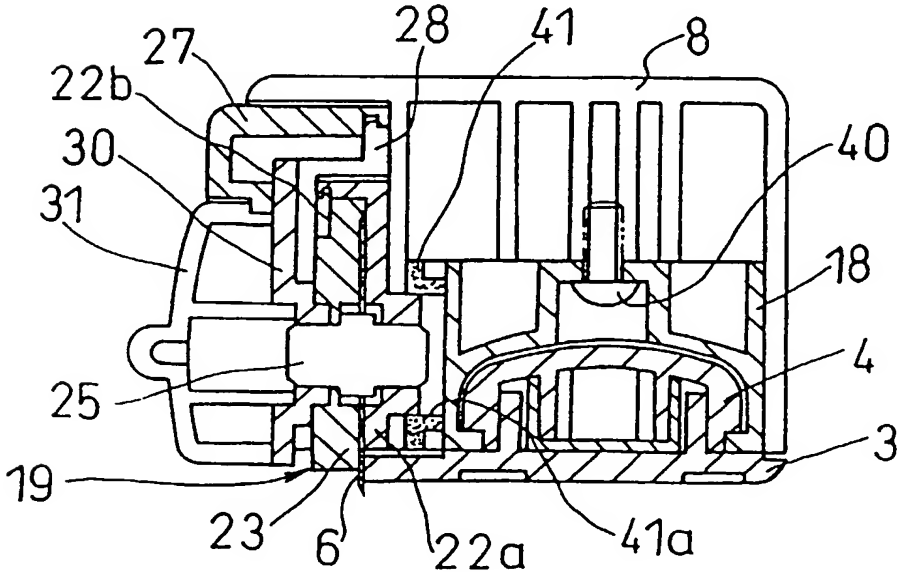


FIG.15

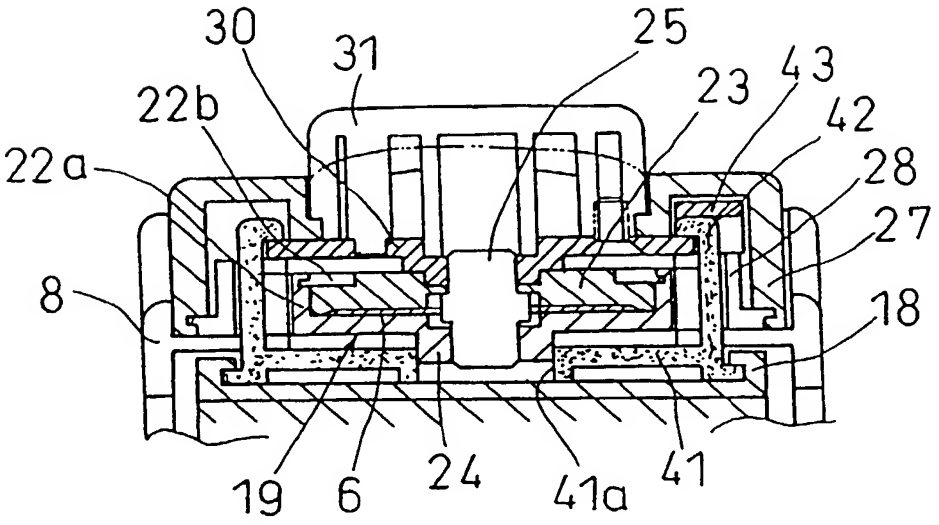


FIG.16 (Prior Art)

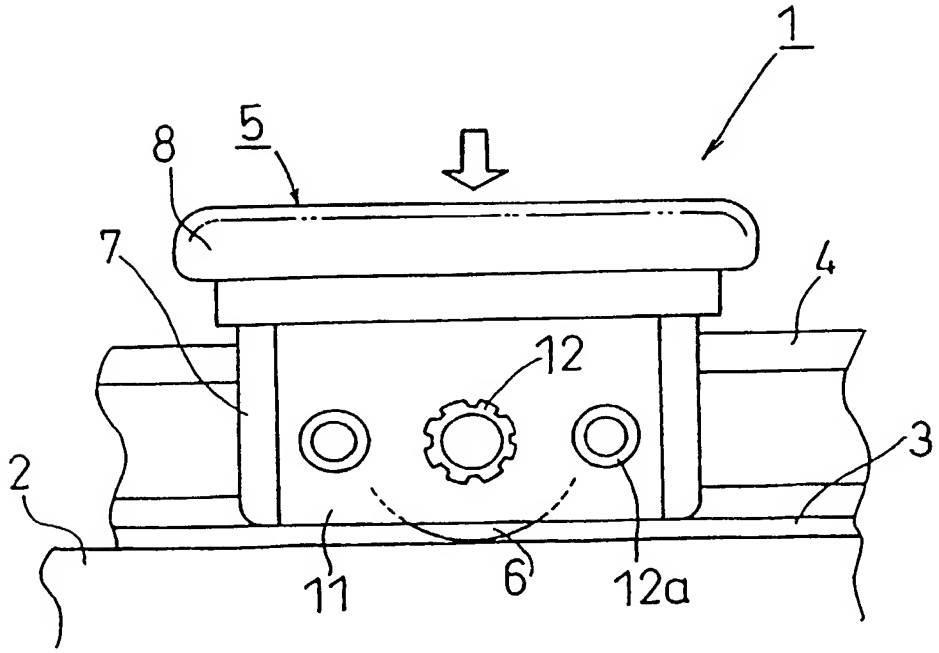


FIG.17 (Prior Art)

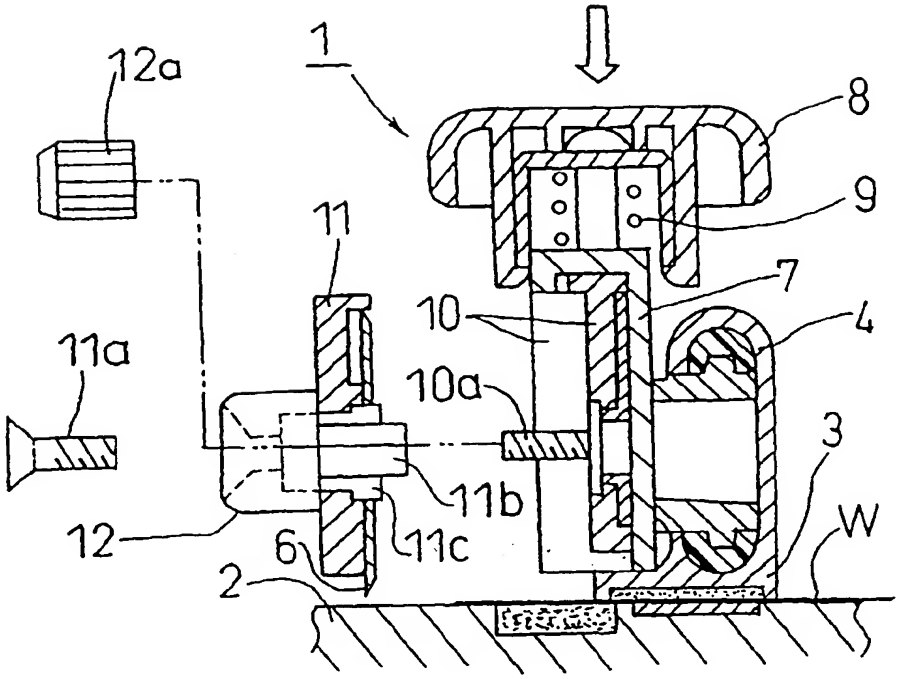
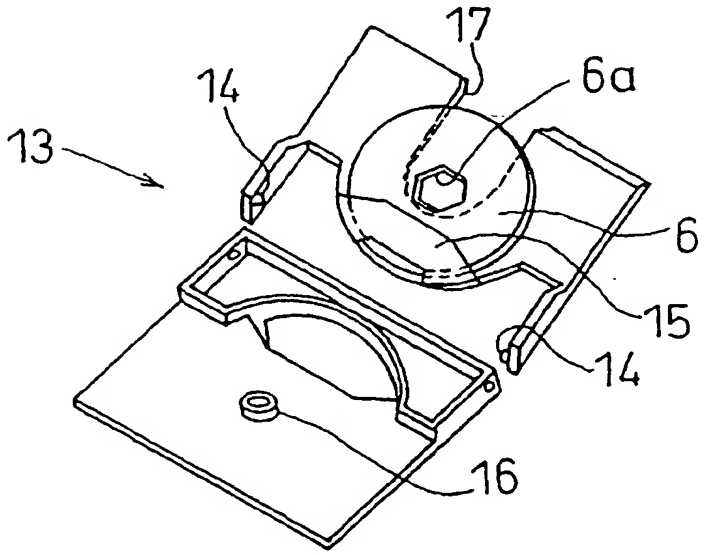


FIG.18 (Prior Art)



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